Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PRELIMINARY NOTES ON SOME IGNEOUS ROCKS OF JAPAN. V[1]

S. KÔZU
Imperial Geological Survey of Japan

V. POTASH-RHYOLITE

Introduction.—The rock is of limited occurrence, forming a hill called Manzōyama, with the height of 200 meters above the sea-level and the base-area of about 1.62 square kilometers, standing near the bay of Shimoda, which is situated at the southern end of the Izu Peninsula, projecting southward from the middle of the main island of Japan, and is well known as the port first visited by Commodore Perry.

The rock occurs as a lava-flow, not widely extended, but of considerable thickness. On the southwestern foot of the hill, a distinct prismatic jointing in the lower part of the lava can be observed. Its eruption was preceded by that of the so-called plagioliparite, and was followed by an enormous outpouring of andesitic rocks after a somewhat long interval. The eruptions of these rocks seem to have happened about the middle of Tertiary time. Tuffites derived from these rocks contain sharks' teeth (mostly *Carcharodon megarodon* and *Lamina* sp.), *Lithothamnium*, and several kinds of foraminifera. The age of the formation is considered as Miocene.

Petrographical characters.—Megascopically, the rock is characterized by its color, which varies from brownish-red to light reddish-gray with a violet tinge, which distinguishes it from other rocks occurring in the region. Its texture is indistinctly porphyritic, owing to the small size of the phenocrysts, from 1 mm. to 2 mm. in length. The only phenocrysts are feldspar crystals with prismatic and tabular habits, scattered in an aphanitic groundmass. There are also well-defined prismatic or irregularly outlined cavities having the crystal form of hornblende, in which the mineral material is entirely altered to a dark-brown loose substance. Their sizes are usually smaller than those of the feldspar phenocrysts. In this rock-type, phenocrysts of quartz are entirely wanting. Flow-structure is a constant feature; sometimes red flow-lines are distinctly marked in the light-colored groundmass.

---

[1] Published by permission of the Director of the Imperial Geological Survey of Japan.

Under the microscope the porphyritic character is pronounced. Fairly numerous phenocrysts of sanidine and a very small quantity of magnetite are scattered through the hyalocrystalline groundmass. Needles of apatite and minute crystals of zircon occur as accessory constituents.

Sanidine phenocrysts, which are the only important constituent mineral, occur both in tabular and in prismatic forms, with more or less rounded outline. They are simple or twinned, and in many instances, inclose clouded patches of glass and minute crystals of apatite and iron ores. The characteristic cracks, sometimes filled with reddish-brown iron oxide, are also observed. It has a low refraction and low double refraction, and exhibits a very small optic angle, which is nearly zero. In a specimen of brecciated lava, the sanidine is entirely replaced by a colorless substance which is isotropic, and has slightly higher refraction than that of Canada balsam. From these characters, it appears to be opal.

The groundmass consists essentially of potash-feldspar and devitrified glass in nearly equal proportion though their relative amounts vary somewhat in different places. The feldspar is variable both in shape and size. Some of the crystals show a distinct prismatic form, commonly twinned, but others are irregularly outlined. The glass base is more or less densely clouded with reddish-black, opaque spots or rods, their presence affecting the color of the rock. In rare instances very minute flakes of deep reddish-brown mica can be detected among them.

Chemical characters.—The analysis of the rock, from the western foot of Manžōyama, was made by K. Yokoyama in the laboratory of the Survey. The result is given as follows:

	A	B	C
SiO_2	70.75	68.13	69.06
Al_2O_3	12.44	15.75	14.41
Fe_2O_3	2.66	1.60	1.89
FeO	0.79	0.74	0.54
MgO	0.08	0.45	0.39
CaO	0.39	0.27	trace
Na_2O	0.39	0.61	0.24
K_2O	11.51	10.54	12.33
H_2O	0.84*	1.90	0.96
TiO_2	0.53	0.31	0.24
P_2O_5	0.10	trace	0.08
MnO	0.09	....	....
SO_3	....	0.07	0.28
CO_2	....	....	0.24
Total	100.57	100.37	100.51

* Loss on ignition.

A. Potash-rhyolite from Manzōyama, Izu. K. Yokoyama, analyst.

B. Quartz-porphyry from Himmelberg, Bl. Lebach, Prussia, described by Weiss and Gebe. K. Boettcher, analyst.

C. Quartz-orthoclasite from Mutterbach. Masserthal, Thueringerwald, described by H. Loretz. Hampe, analyst.

The chemical character of the rock from Manzōyama is noticeable on account of the extremely high percentage of potash, from which it is seen that the sanidine is entirely free from isomorphous mixtures of other feldspars. The quartz-porphyry from Himmelberg and quartz-orthoclasite from Mutterbach, the chemical compositions of which are given in columns B and C, are quite similar to the rock from Manzōyama.

	A	B	C
Quartz	25.2	23.2	19.9
Orthoclase	67.8	62.3	72.8
Albite	....	5.2	2.1
Anorthite	....	1.4	....
Corundum	....	2.8	0.6
Acmite	2.8	....	....
Diopside	0.7	....	....
Hypersthene	....	1.1	1.0
Ilmenite	1.1	0.6	0.5
Magnetite	0.6	1.4	1.2
Hematite	1.1	0.6	1.1
Apatite	0.3	....	....
Total	99.6	98.6	99.2

From the norms, ratios are given as below.

	A	B	C
$\frac{Sal}{Fem}$	14.09	25.41	25.11
$\frac{Q}{F}$	0.37	0.33	0.27
$\frac{K_2O'+Na_2O'}{CaO'}$	∞	24.4	∞
$\frac{K_2O'}{Na_2O'}$	∞	11.20	32.75

The magmatic name of the rock from Manzōyama is lebachose, in which division only a few rock-analyses are so far known to belong. On account of the richness in potash, the writer distinguishes the rock as potash-rhyolite.